

## **Title: In Debt or Not In Debt**

### **Brief Overview:**

In this unit the students will be able to use the TI-83 finance application – TVM (Time-Value-Money) solver. The students will be able to see the effects of varying interest rates of credit cards.

### **NCTM 2000 Principles for School Mathematics:**

- **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

### **Links to NCTM 2000 Standards:**

- **Content Standards**

#### **Number and Operations**

Students will be able to understand the relationships between the variables involved with credit cards. They will be able to understand numbers, ways of representing numbers, relationships among numbers, and number systems. They also will be able to use the graphing calculator to perform computations.

#### **Algebra**

Students will be able to represent and analyze mathematical situations and structures using algebraic symbols. They will be able to use mathematical models to represent and understand quantitative relationships, as well as be able to analyze changes in various contents.

- **Process Standards**

**Problem Solving**

Students will be able to build new mathematical knowledge through problem solving. They will be able to solve problems that arise in real-world situations.

**Communication**

Students will be able to communicate their thinking coherently and clearly to peers, teachers and others. They will be able to use the language of mathematics to express mathematical ideas precisely.

**Connections**

Students will be able to recognize and apply mathematics in contexts outside of mathematics.

**Representation**

Students will be able to use representations to model and interpret mathematical phenomena.

**Links to Maryland High School Mathematics Core Learning Units:**

**Functions and Algebra**

- **1.1.1**

The students will recognize, describe, and extend patterns and functional relationships that are expressed numerically, algebraically, and geometrically.

- **1.1.2**

The students will represent patterns and functional relationships in a table, as a graph, and/or by mathematical expression.

- **1.2.5**

The students will apply formulas and use matrices to solve real-world problems.

**Grade/Level:**

Grades 9-12, Algebra I & II, Consumer Math

**Duration/Length:**

Approximately 3 days (90 minute block schedule)

**Prerequisite Knowledge:**

Students should have working knowledge of the following skills:

- Estimating
- Inputting data into the graphics calculator
- Understanding percents
- Interpreting data from a table and/or graph

**Student Outcomes:**

Students will be able to:

- use the finance application of the TI-83.
- make an informed decision regarding credit cards and their interest rates.
- understand basic terminology related to credit cards.
- utilize information in the form of a table or graph.

**Materials/Resources/Printed Materials:**

- Warm-up
- Class Activity Worksheet, Group Activity Worksheet, and Homework Worksheet
- Credit Card Information Sheet
- Definition Posters
- Related Reading Articles
- Procedures for graphics calculator
- TI-83 or TI-83 Plus Graphics Calculator/Overhead

**Development/Procedures:****Day 1**

- 1.) Have students complete warm-up. Review answers using the definition posters.
- 2.) Have students read the articles and lead a small discussion on the information in the article. Articles can be found at [www.nfcc.org](http://www.nfcc.org).  
“2001 high school financial literacy” – posted Wednesday, June 20, 2001  
“2000 credit card facts” – posted Monday, January, 1, 2001 (updated version available)
- 3.) Pass out the procedures for graphics calculator worksheet and the class activity worksheet and work through each example with the students.
- 4.) Pass out Credit Card Information and group activity worksheet (day 1) and assign students to groups of 2-3 and have students work on the questions for credit cards with no introductory rates.
- 5.) If time allows, have students present answers to class.

## **Day 2**

- 1.) Review answers from day 1 if necessary.
- 2.) Discuss introductory rates. (Note: Bring in credit card offers from the mail if you have them to use.) Do a few examples to demonstrate how the procedure is different.
- 3.) Pass out credit card information and Group Activity Worksheet (Day 2) and assign students to groups of 2-3 and have students work on the questions for credit cards with introductory rates.
- 4.) If time allows, have students present answers to the class
- 5.) Pass out homework worksheet. Have students complete and be prepared to discuss the answers next class.

## **Day 3**

- 1.) Review answers to homework and discuss findings.
- 2.) Pass out the assessment and allow students to complete

### **Assessment:**

This unit includes an assessment that asks students to make an informed decision when comparing two credit cards. This task will assess how well the students understand the vocabulary, skills, and reasoning processes of finance calculations. The students will be asked to present their findings through written communication using a four-point rubric scale.

### **Extension/Follow Up:**

- Students can explore the difference between the interest rate of purchases versus cash advances.
- Students can explore various charges that can affect your statement/payment such as late payment fees or over the limit credit fees.

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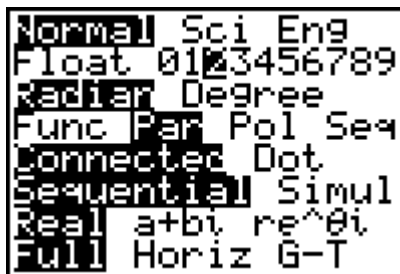
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## Graphing Calculator Steps

### Setting the Correct Mode:

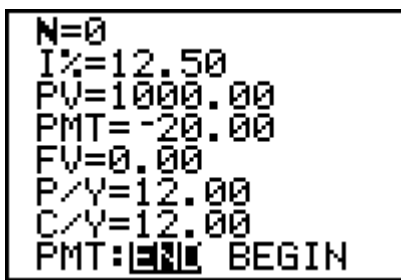
- 1.) Press the **MODE** key
- 2.) Highlight as indicated.

\*To turn a mode on, simply use the arrow keys to move to the desired choice and hit **ENTER**



### Using the Finance Feature:

- 1.) Press **2<sup>nd</sup>** **x<sup>-1</sup>** (on TI-83) or press **APPS** and choose 1: Finance (on TI-83 Plus)
- 2.) Choose 1:TVM Solver...
- 3.) Set up your screen with the appropriate information. For example this screen is set up for an initial balance of \$1000 with an interest rate of 12.5% and a payment per month of \$20. (Note: the PMT should be negative so that the current balance will decrease.) We will solve for the number of payments so it does not matter what value N is now.



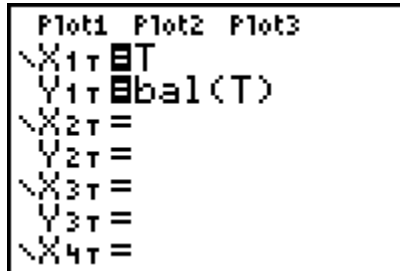
N = Number of payments  
I% = Interest in terms of percent  
PV = Present value  
PMT = Payment made  
FV = Future value  
P/Y = Payments per year

**\*To keep consistent, make sure students calculate the payment at the END.**

- 4.) Use the arrow key to select the variable that you want to calculate. (In this case we want to calculate N, the number of payments.)
- 5.) Press **ALPHA** **ENTER** to solve for the indicated variable.

## Graphing

- 1.) Press  $\boxed{Y=}$
- 2.) Enter equations to look like this screen:



```
Plot1 Plot2 Plot3
X1T=T
Y1T=bal(T)
X2T=
Y2T=
Z2T=
X3T=
Y3T=
Z3T=
X4T=
```

- To get **T**: use  $\boxed{X,T,\theta,n}$
- To get **bal (** : go to the finance menu then choose 9:bal (

- 3.) Set your window to see your graph. From our example problem above we need to set our window to look like this:  

Tmin = 0	Xmin = 0	Ymin = 0
Tmax = 75	Xmax = 75	Ymax = 1200
Tstep = 5	Xscl = 5	Yscl = 100
- 4.) To see a graph, hit  $\boxed{\text{GRAPH}}$  or to see the table, hit  $\boxed{2^{\text{nd}}}\boxed{\text{GRAPH}}$

## Setting the Mode for Split Graph/Table

If you want to see both the graph and table at the same time, go to  $\boxed{\text{MODE}}$  and set the last row to G-T. To return, set the mode to FULL.

## In Debt or Not in Debt

### Warm Up

Directions: Cut out the words and definitions below. Match each word with its definition. Even though you may not know the word, make your best educated guess.

<b>Amortization</b>	A written statement required by the Federal Reserve that gives the terms and conditions of a credit card account.
<b>Annual Fee</b>	Calculated by adding each day's daily balance then dividing that total by the number of days in the billing cycle.
<b>Single Purpose Credit Card</b>	A membership or participation fee charged by most credit card companies.
<b>Average Daily Balance</b>	The monthly bill you receive from the credit card company which includes a summary of all account activity.
<b>Credit Report</b>	A yearly fixed or variable interest rate that measures the cost of credit and reflects the total yearly cost of the interest on a loan.
<b>Minimum Payment</b>	The paying back of a debt at regular intervals with equal payments.
<b>Annual Percentage Rate (APR)</b>	A file about you that includes where you work and live, how you pay your bills, and whether you have been sued, arrested, or filed for bankruptcy.
<b>Billing Statement</b>	The length of time a credit card issuer is willing to lend you its money for free.
<b>Card Holder Agreement</b>	The smallest amount of money paid to keep the account from going into default.
<b>Grace Period</b>	A credit card that is issued by a specific company and honored only by that company and its affiliates.

## In Debt or Not in Debt – Class Activity Worksheet

Name \_\_\_\_\_

Date \_\_\_\_\_

Suppose that you are a member of the typical American household and your family carries a credit card debt of \$7942. Use the TVM (Time-Value-of-Money) Solver to model a few credit card scenarios. (Note: Use months rounded to the nearest hundredths on all calculations.)

- 1.) If the average annual interest rate is 17.11%, how many months will it take the average American family to pay off their debt of \$7,942 if they make a minimum payment of \$175 each month and no additional purchases are made?
- 2.) How much interest did you pay during this time?
- 3.) Your credit card is going to cut you a break and lower your annual interest rate to a low 15.5%. If you keep the minimum payment at \$175 a month, how many months will it take to pay off the debt of the average American family?
- 4.) Let's assume that you want to pay off your debt fairly quickly. If you want to pay off the balance in 3 years, what does your minimum monthly payment have to be at a 15.5% interest rate?
- 5.) If you want to pay off your debt in 3 years and you want to make a payment of \$250 a month, what annual interest would you need to do this?
- 6.) Use the table function to answer the following question.  
Using the original balance of \$7,942 with the average annual interest rate of 17.11%, in how many months will it take to cut that balance in half if you are making a monthly payment of \$125?



## Credit Card Information

<b>Credit Card</b>	<b>Introductory interest rate</b>	<b>Interest rate</b>	<b>Minimum Payment (higher of the two options)</b>
<b>Discover Card</b>	N/A	17.99%	5% of balance or \$15
<b>Gap Card</b>	N/A	19.8%	8% of balance or \$25
<b>American Eagle</b>	N/A	18.21%	4% of balance or \$10
<b>J. Crew</b>	N/A	21.24%	10% of balance or \$30
<b>LL Bean</b>	N/A	14.99%	5% of balance or \$15
<b>Next Card Internet Visa</b>	2.9% for 6 months	9.9%	5% of balance or \$10
<b>Capital One Student Visa Card</b>	2.5% for 6 months	19.8%	3% of balance or \$10
<b>American Express Blue for Students</b>	8.90% for 6 months	15.99%	10% of balance or \$25
<b>Juniper</b>	0.0% for 4 months	15.99%	8% of balance or \$20
<b>Fusion Visa</b>	6.9% for 6 months	13.4%	7% of balance or \$25

## **In Debt or Not in Debt – Group Activity Worksheet (Day 1)**

Name \_\_\_\_\_

Date \_\_\_\_\_

Credit Card \_\_\_\_\_

As a group you are to analyze each question using the information for your particular credit card.  
(Note: Use months rounded to the nearest hundredths on all calculations.)

You went on a back-to-school shopping spree and charged \$250 worth of merchandise on your credit card. Use the TVM solver to calculate the following:

- 1.) What is the minimum payment required on your charges according to your credit card?
- 2.) How many months will it take you to pay off your debt if you pay the minimum payment each month and you make no additional purchases?
- 3.) How much money will you pay in interest?
- 4.) Use the table function to determine when you will have paid half of your original principal.
- 5.) Change the monthly payment to \$35. How many months would it take you to pay off your original balance using this monthly payment assuming you make no additional purchases?
- 6.) Using the table function, what is your balance after four payments using the monthly payment schedule from number five?
- 7.) How much money will you save overall by making a higher monthly payment?
- 8.) After making payments for three months, you charge an additional \$125 worth of merchandise on your card. However, you continue to only make the minimum payment. How many months will it take you to pay off your new balance?

## **In Debt or Not in Debt – Group Activity Worksheet (Day 2)**

Name \_\_\_\_\_

Date \_\_\_\_\_

Credit Card \_\_\_\_\_

As a group you are to analyze each question using the information for your particular credit card.

You just found out that your favorite band is going to be playing at the Civic Center in the next town over. Bubbling over with excitement, you call and find that you have the opportunity to get front row or catwalk seats. The seats are \$250 each and you know that three of your best friends would love to go as well. Remembering that you have your new credit card, you charge four tickets and hope that your friends will pay you back later.

- 1.) You charge the tickets by phone even though there is a \$7 fee per ticket for this convenience. What is your total balance?
- 2.) What is the minimum payment required for your charges according to your credit card?
- 3.) You tell your friends they need to pay you back in six months so you can pay off your credit card before the introductory rate is over. How much would your monthly payment need to be to pay off your balance by six months?
- 4.) Your friends say they can't pay you back that fast and you must resort to paying only the minimum payment. Keeping in mind that in 6 months you will have a new interest rate, how long will it take you to pay off your balance?
- 5.) How much interest did you pay by only making the minimum payment?

## **In Debt or Not in Debt**

### **Homework Worksheet**

Name \_\_\_\_\_ Date \_\_\_\_\_

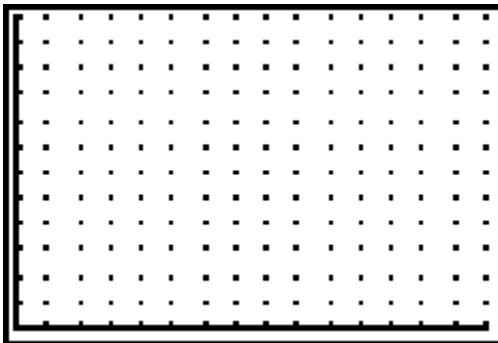
In January, Jamie gets an offer in the mail for a new Visa with a low introductory rate of 3.9%. He is so excited that he goes out and charges a stereo system for \$2,500. Jamie assumes that he will be able to easily pay this off because the interest rate is so low.

(Note: Use months rounded to the nearest hundredths on all calculations.)

- 1.) Jamie uses his calculator to help him figure out how long it will take him to pay off his hip stereo system. Jamie has a low-paying part-time job. He plans to pay \$50 a month on his stereo. How long will it take him if he follows this plan?
  
  
  
  
  
  
  
  
  
  
- 2.) In June, six months later, Jamie gets his new statement and is shocked to find out that his interest rate is now 19.8%. What is his remaining balance to date?
  
  
  
  
  
  
  
  
  
  
- 3.) Assuming he can still make a monthly payment of \$50, how long, at this new interest rate will it take him now to pay off the remainder of his debt?
  
  
  
  
  
  
  
  
  
  
- 4.) Jamie wants to pay off the remainder of his debt in 3 years. What is the monthly payment that he needs to make in order pay off the stereo in this amount of time?

### In Debt or Not in Debt – Homework Worksheet Continued

- 5.) Jamie uses this new monthly payment for the next six months. What is his remaining balance at the end of the year?
- 6.) After making a full year of payments, Jamie is walking through the mall and finds some awesome equipment to complement his stereo system for the incredible price of \$1,225. Assuming Jamie keeps the same monthly payment from number 4, how long will it take him to pay off his new balance?
- 7.) Jamie lost his part-time job. His parents have agreed to give him \$40 a month to pay on his bill. How long will it take him to pay off his debt with this new monthly payment?
- 8.) Use the graph and table function on your calculator and sketch the graph on the grid below. Describe and explain the situation.



## In Debt or Not in Debt – Class Activity Worksheet

### Answer Key

Suppose that you are a member of the typical American household and your family carries a credit card debt of \$7,942. Use the TVM (Time-Value-of-Money) Solver to model a few credit card scenarios.

(Note: Use months rounded to the nearest hundredths on all calculations.)

- 1.) If the average annual interest rate is 17.11%, how many months will it take the average American family to pay off their debt of \$7,942 if they make a minimum payment of \$175 each month and no additional purchases are made?

```
■ N=73.57
I%=17.11
PV=7942.00
PMT=-175.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [ ] [ ] [ ] BEGIN
```

**Approximately 74 months or 6 years and 2 months.**

- 2.) How much interest did you pay during this time?

$$175 * 73.57 = \$12874.75$$

$$12874.75 - 7942 = \$4932.75$$

- 3.) Your credit card is going to cut you a break and lower your annual interest rate to a low 15.5%. If you keep the minimum payment at \$175 a month, how many months will it take to pay off the debt of the average American family?

```
■ N=68.75
I%=15.50
PV=7942.00
PMT=-175.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [ ] [ ] [ ] BEGIN
```

**Approximately 69 months or 5 years and 9 months.**

- 4.) Let's assume that you want to pay off your debt fairly quickly. If you want to pay off the balance in 3 years, what does your minimum monthly payment have to be at a 15.5% interest rate?

```

N=36.00
I%=15.50
PV=7942.00
PMT=-277.26
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [mode] BEGIN

```

The minimum payment would be \$277.26.

- 5.) If you want to pay off your debt in 3 years and you want to make a payment of \$250 a month, what annual interest would you need to do this?

```

N=36.00
I%=8.31
PV=7942.00
PMT=-250.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [mode] BEGIN

```

Approximately 8.31%.

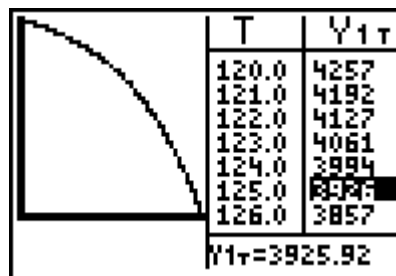
- 6.) Use the table function to answer the following question.  
Using the original balance of \$7,942 with the average annual interest rate of 17.11%, in how many months will it take to cut that balance in half if you are making a monthly payment of \$125?

Set the window as follows.

T[-5, 170, 1]

X[0, 170, 10]

Y[0, 8000, 100]



It will take approximately 125 months to cut the balance in half.

**Answer Chart for Group Activity Worksheet (Day 1)**

<b>Credit Card</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>Discover</b>	<b>\$15</b>	<b>20 months</b>	<b>\$39.80</b>	<b>11 months</b>	<b>8 months</b>	<b>\$122.15</b>	<b>\$23.45</b>	<b>28 months</b>
<b>Gap</b>	<b>\$25</b>	<b>12 months</b>	<b>\$25.50</b>	<b>6 months</b>	<b>8 months</b>	<b>\$123.42</b>	<b>\$7.40</b>	<b>18 months</b>
<b>American Eagle</b>	<b>\$10</b>	<b>32 months</b>	<b>\$66.70</b>	<b>18 months</b>	<b>8 months</b>	<b>\$122.30</b>	<b>\$50.00</b>	<b>52 months</b>
<b>J. Crew</b>	<b>\$30</b>	<b>10 months</b>	<b>\$23</b>	<b>5 months</b>	<b>8 months</b>	<b>\$124.41</b>	<b>\$3.50</b>	<b>14 months</b>
<b>LL Bean</b>	<b>\$15</b>	<b>19 months</b>	<b>\$32</b>	<b>10 months</b>	<b>8 months</b>	<b>\$120.07</b>	<b>\$18.45</b>	<b>30 months</b>



**Answer Chart for Group Activity Worksheet (Day 2)**

<b>Credit Card</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Next Card</b>	<b>\$1,028.00</b>	<b>\$51.40</b>	<b>\$172.79</b>	<b>22 months</b>	<b>\$63.22</b>
<b>Capitol One</b>	<b>\$1,028.00</b>	<b>\$30.84</b>	<b>\$172.58</b>	<b>44 months</b>	<b>\$309.22</b>
<b>American Express</b>	<b>\$1,028.00</b>	<b>\$102.80</b>	<b>\$175.81</b>	<b>11 months</b>	<b>\$51.40</b>
<b>Juniper</b>	<b>\$1,028.00</b>	<b>\$82.24</b>	<b>\$171.33</b>	<b>13 months</b>	<b>\$27.96</b>
<b>Fusion</b>	<b>\$1,028.00</b>	<b>\$71.96</b>	<b>\$174.80</b>	<b>15 months</b>	<b>\$47.80</b>

## In Debt or Not in Debt -Homework Worksheet

### Answer Key

In January, Jamie gets an offer in the mail for a new Visa with a low introductory rate of 3.9%. He is so excited that he goes out and charges a stereo system for \$2,500. Jamie assumes that he will be able to easily pay this off because the interest rate is so low.

(Note: Use months rounded to the nearest hundredths on all calculations.)

- 1.) Jamie uses his calculator to help him figure out how long it will take him to pay off his hip stereo system. Jamie has a low-paying part-time job. He plans to pay \$50 a month on his stereo. How long will it take him if he follows this plan?

```
■ N=54.65
I%=3.90
PV=2500.00
PMT=-50.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [I/Y] [P/Y] [C/Y] BEGIN
```

It will take him approximately 55 months.

- 2.) In June, six months later, Jamie gets his new statement and is shocked to find out that his interest rate is now 19.8%. What is his remaining balance to date?

```
N=6.00
I%=3.90
PV=2500.00
PMT=-50.00
■ FV=-2246.70
P/Y=12.00
C/Y=12.00
PMT: [I/Y] [P/Y] [C/Y] BEGIN
```

His remaining balance to date is \$2246.70.

- 3.) Assuming he can still make a monthly payment of \$50, how long, at this new interest rate, will it take him to pay off the remainder of his debt?

```
■ N=82.65
I%=19.80
PV=2246.70
PMT=-50.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [I/Y] [P/Y] [C/Y] BEGIN
```

It will take him approximately 83 months to pay off the remainder of his debt.

- 4.) Jamie wants to pay off the remainder of his debt in 3 years. What is the monthly payment that he needs to make in order to pay off the stereo in this amount of time?

```

N=36.00
I%=19.80
PV=2246.70
PMT=-83.27
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [ ] [ ] [ ] BEGIN

```

**In order to pay off his debt in three years, he will have to pay \$83.27 each month.**

- 5.) Jamie uses this new monthly payment for the next six months. What is his remaining balance at the end of the year?

```

N=6.00
I%=19.80
PV=2246.70
PMT=-83.27
FV=-1957.84
P/Y=12.00
C/Y=12.00
PMT: [ ] [ ] [ ] BEGIN

```

**His remaining balance after one year is \$1957.84. Note that the number of months is 6 because he already paid six months at the new introductory rate.**

- 6.) After making a full year of payments, Jamie is walking through the mall and finds some awesome equipment to complement his stereo system for the incredible price of \$1,225. Assuming Jamie keeps the same monthly payment from number 4, how long will it take him to pay off his new balance?

```

N=60.87
I%=19.80
PV=3182.84
PMT=-83.27
FV=0.00
P/Y=12.00
C/Y=12.00
PMT: [ ] [ ] [ ] BEGIN

```

**It will take him approximately 61 months or 5 years and 1 month.**

- 7.) Jamie lost his part-time job. His parents have agreed to give him \$40 a month to pay his credit card bill. How long will it take him to pay off his debt with this new monthly payment?

```

N=
I%=19.80
PV=3182.84
PMT=-40.00
FV=0.00
P/Y=12.00
C/Y=12.00
PMT:12.00 BEGIN

```

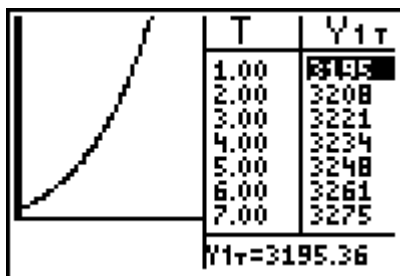
```

ERR:DOMAIN
1:Quit
2:Goto

```

When solving for N, you will get an error. This is because the remaining balance will never reach zero.

- 8.) Use the graph and table function on your calculator and sketch the graph on the grid below. Describe and explain the situation.



The window should be set to the following:

T[0, 167, 1]

X[0, 167, 11]

Y[3000, 8000, 100]

Students should convey the fact that the interest accumulated is greater in value than Jamie's monthly payment.

## **Assessment**

### **Teacher's Guide**

This assessment is designed to verify that students can successfully use the finance application on the TI-83 graphics calculator. Students will use the information that they gather to make an informed decision concerning credit cards.

### **Tools/Materials Needed for Assessment**

- TI-83 or TI-83 Plus Graphics Calculator
- Assessment Worksheet

### **Administering the Assessment**

This assessment should take approximately 50 minutes, and it is to be completed independently. Students should be given a copy of the rubric prior to the assessment.

## In Debt or Not in Debt

### Assessment Worksheet

Name \_\_\_\_\_

Date \_\_\_\_\_

Jamie has learned a great deal about the value of his dollars. His friend Moby is seeking his advice after he too receives two credit card offers in the mail. He shows these two offers to Jamie to ask which one is the better deal.

The two offers Moby received are described below.

<b>Super Duper Credit Card</b>	<b>No Worry Credit Card</b>
Low introductory rate of 3.9% for the first six months.  * After the first six months, the APR is 19.8%	A low fixed APR of 13.9%

Moby is planning his summer vacation. He has narrowed his choices down to Ocean City or Daytona Beach. He plans to charge his entire one-week vacation.

#### Situation 1

If Moby chooses Ocean City, it will cost him \$800 for his entire trip. He figures he can make \$50 monthly payments. If Moby decides to go to Ocean City, which card should he choose?

Use mathematics to explain and justify your answer. Use words, symbols, or both in your explanation and justification.

**Situation 2**

If Moby chooses Daytona Beach, it will cost him \$2800 for his trip. If he charges this amount, he will make \$100 monthly payments. If Moby decides to go to Daytona Beach, which card should he choose?

Use mathematics to explain and justify your answer. Use words, symbols, or both in your explanation and justification.

**Situation 3**

Now that Jamie has analyzed both situations, he is ready to give Moby his advice. Write a brief e-mail to Moby describing to him the advantages and disadvantages of both credit cards. Be sure to include facts from your work such as the amount of the purchase, the number of payments required, and the amount of interest paid.

## In Debt or Not in Debt

### Assessment Worksheet

#### Answer Key

Jamie has learned a great deal about the value of his dollars. His friend Moby is seeking his advice after he too receives two credit card offers in the mail. He shows these two offers to Jamie to ask which one is the better deal.

The two offers Moby received are described below.

Super Duper Credit Card	No Worry Credit Card
Low introductory rate of 3.9% for the first six months.  * After the first six months, the APR is 19.8%	A low fixed APR of 13.9%

Moby is planning his summer vacation. He has narrowed his choices down to Ocean City or Daytona Beach. He plans to charge his entire one-week vacation.

**A rubric scoring guide is included for Situation 1 and Situation 2.**

#### Situation 1

If Moby chooses Ocean City, it will cost him \$800 for his entire trip. He figures he can make \$50 monthly payments. If Moby decides to go to Ocean City, which card should he choose?

Use mathematics to explain and justify your answer. Use words, symbols, or both in your explanation and justification.

Super Duper	No Worry
<ul style="list-style-type: none"><li>• 17.34 total payments</li><li>• total paid is \$867.00</li><li>• interest paid is \$67.00</li></ul>	<ul style="list-style-type: none"><li>• 17.80 payments</li><li>• total paid is \$890.00</li><li>• interest paid is \$90.00</li></ul>

**Students should discover that even though Moby is making approximately 18 payments, he pays less interest with Super Duper.**



## Situation 2

If Moby chooses Daytona Beach, it will cost him \$2800 for his trip. If he charges this amount, he will make \$100 monthly payments. If Moby decides to go to Daytona Beach, which card should he choose?

Use mathematics to explain and justify your answer. Use words, symbols, or both in your explanation and justification.

Super Duper	No Worry
<ul style="list-style-type: none"><li>• 34.36 payments</li><li>• total paid is \$3436.00</li><li>• total interest paid is \$636.00</li></ul>	<ul style="list-style-type: none"><li>• 34.04 payments</li><li>• total paid is \$3404.00</li><li>• total interest paid is \$604.00</li></ul>

**Students should discover that even though Moby is making approximately 35 payments, he pays less interest with No Worry.**

## Situation 3

Now that Jamie has analyzed both situations, he is ready to give Moby his advice. Write a brief e-mail to Moby describing to him the advantages and disadvantages of both credit cards. Be sure to include facts from your work such as the amount of the purchase, the number of payments required, and the amount of interest paid.

**The major idea that students need to communicate is the fact that the amount of a purchase (in these situations) is the determining factor on which card is chosen. They should also mention the fact that even though the same number of payments are made the amount of interest paid varies.**

## Assessment Scoring Guide

### Rubric for Situation 1 and Situation 2

**3**

- Students will correctly identify the better offer.
- Students will neatly organize their work (i.e., table or chart).
- Students will correctly calculate the number of months needed to pay off the debt.
- Students will correctly calculate the total amount paid.
- Students will correctly calculate the amount of interest paid.

**2**

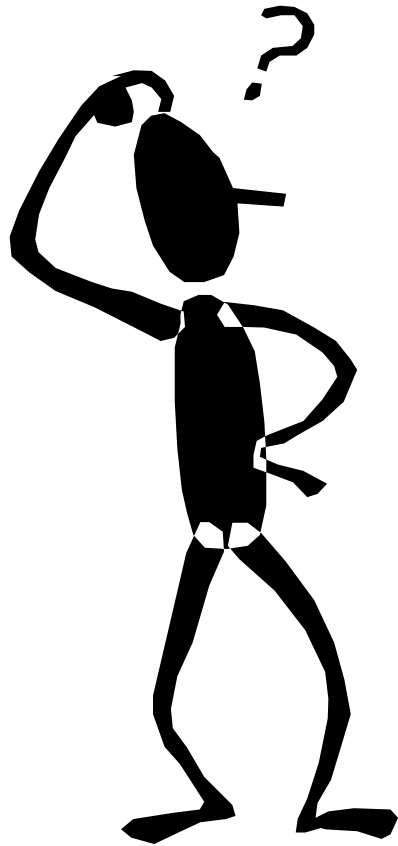
- Student will correctly identify the better offer.
- Students will attempt to organize their work.
- Students may or may not correctly calculate the number of months needed to pay off the debt.
- Students may or may not correctly calculate the total amount paid.
- Students may or may not correctly calculate the amount of interest paid.

**1**

- Student may or may not correctly identify the better offer.
- Students may or may not attempt to organize their work.
- Students may or may not correctly calculate the number of months needed to pay off the debt.
- Students may or may not correctly calculate the total amount paid.
- Students may or may not correctly calculate the amount of interest paid.

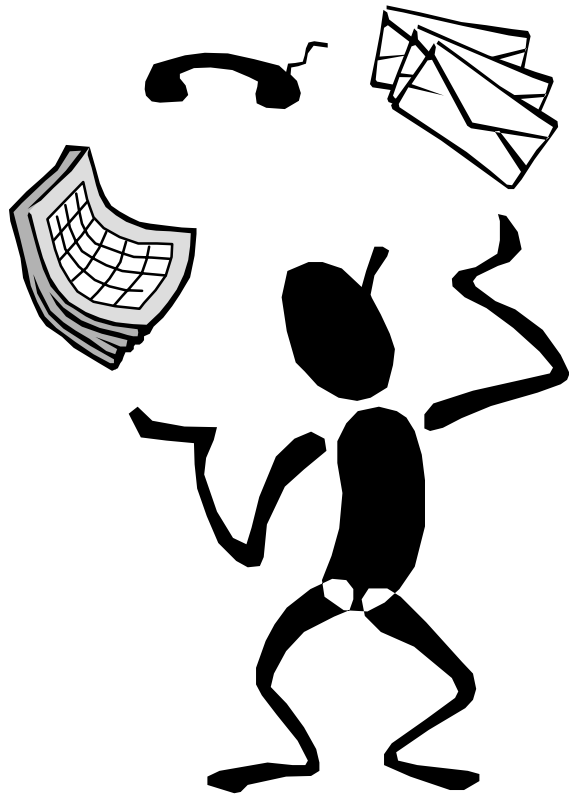
**0**

- Students make little or no attempt to solve the problem.



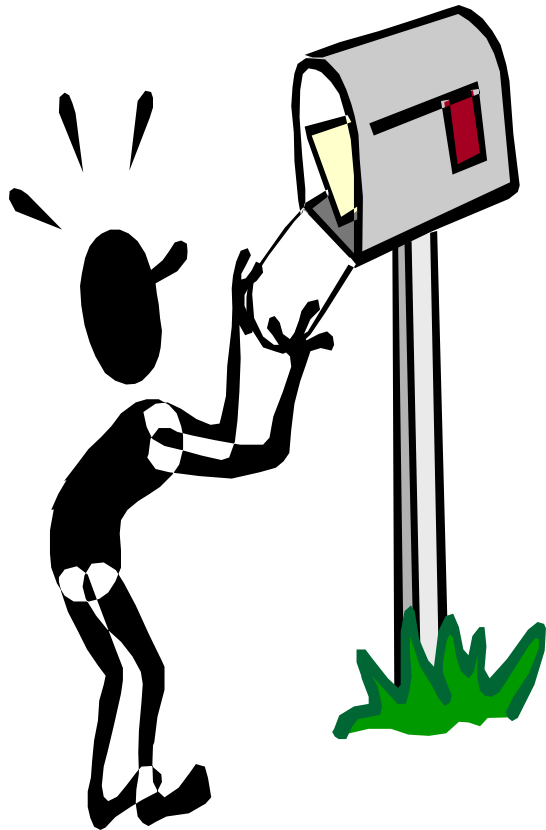
## **APR (Annual Percentage Rate)**

A yearly fixed or variable interest rate that measures the cost of credit and reflects the total yearly cost of the interest on a loan, expressed as a percentage rate.



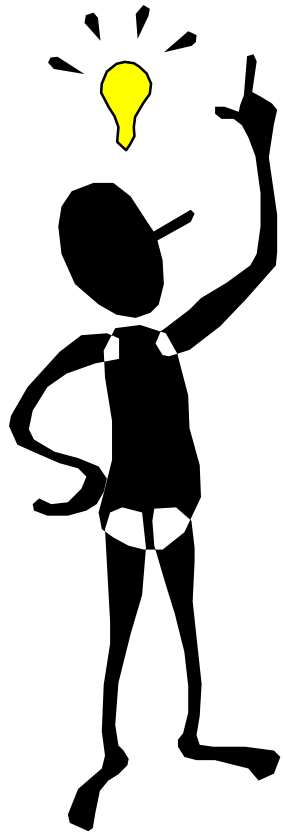
## Average Daily Balance

Calculated by adding each day's daily balance then dividing that total by the number of days in the billing cycle. The average daily balance is then multiplied by a card's monthly periodic rate (divide the annual percentage rate by 12).



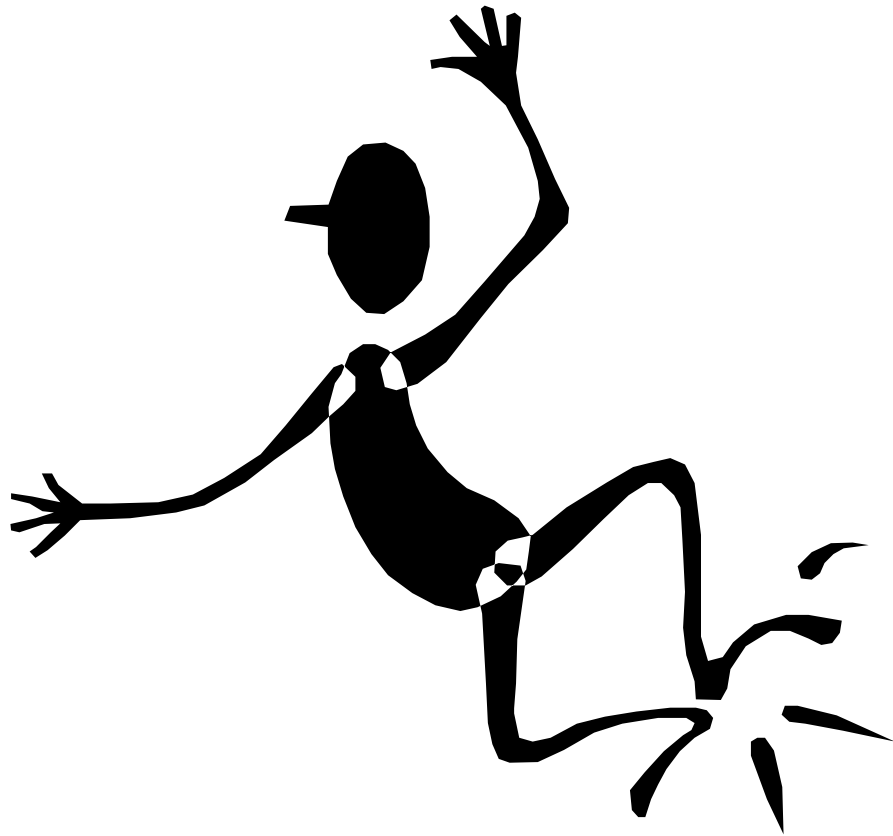
## **Billing Statement**

The monthly bill you receive from the credit card company which includes a summary of all account activity including purchases, payments, credit limit, available credit, and finance charges.



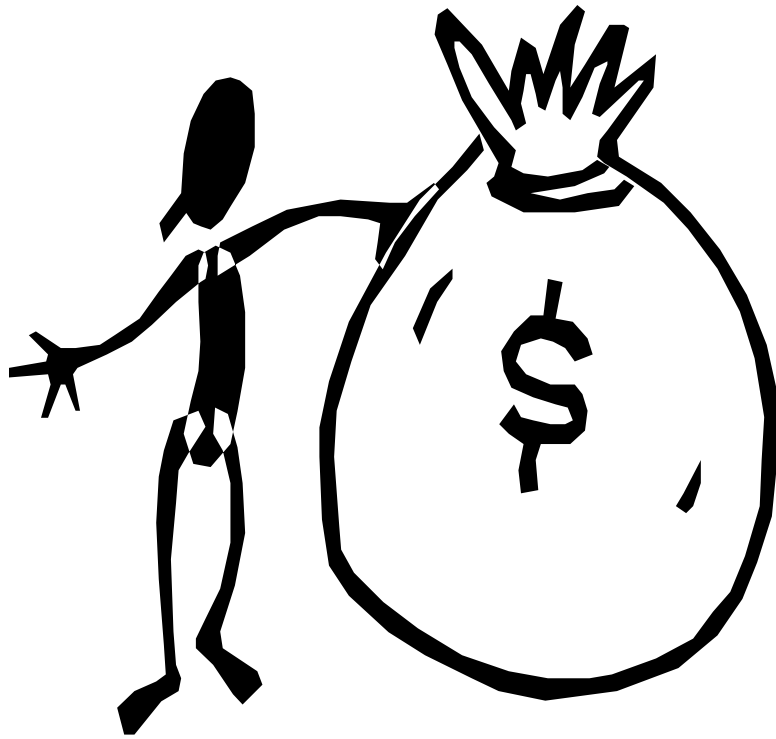
## **Card Holder Agreement**

A written statement required by the Federal Reserve that gives the terms and conditions of a credit card account. It must include the annual fee, formula for minimum payment, APR, and the cardholder's rights in billing disputes.



# **Amortization**

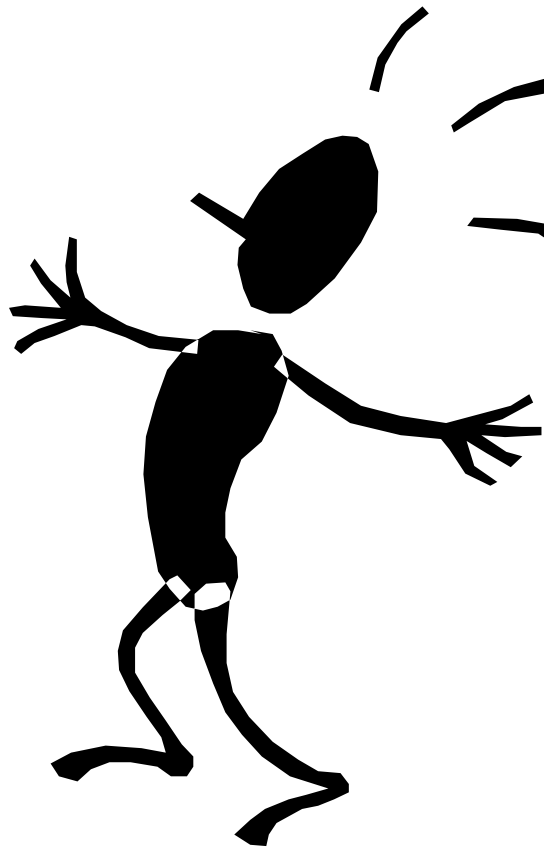
The paying back of a debt at regular time intervals with equal payments.



## Grace Period

The length of time a credit card issuer is willing to lend you its money for free.





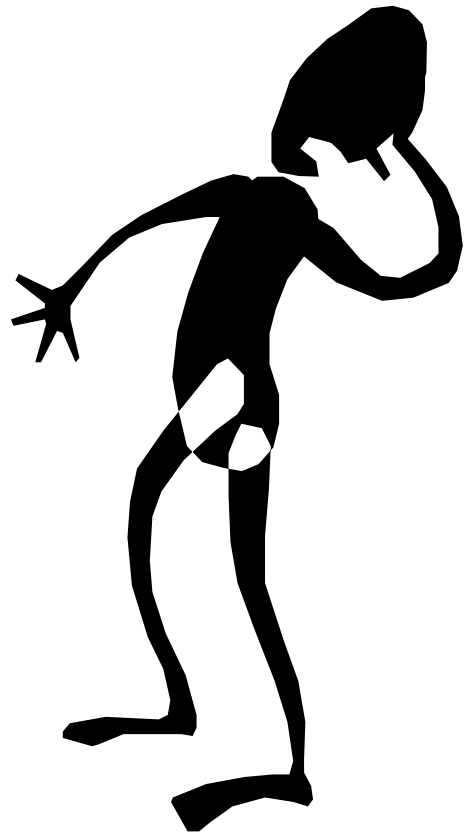
## **Single Purpose Credit Card**

A credit card that is issued by a specific company and honored only by that company and its affiliates.



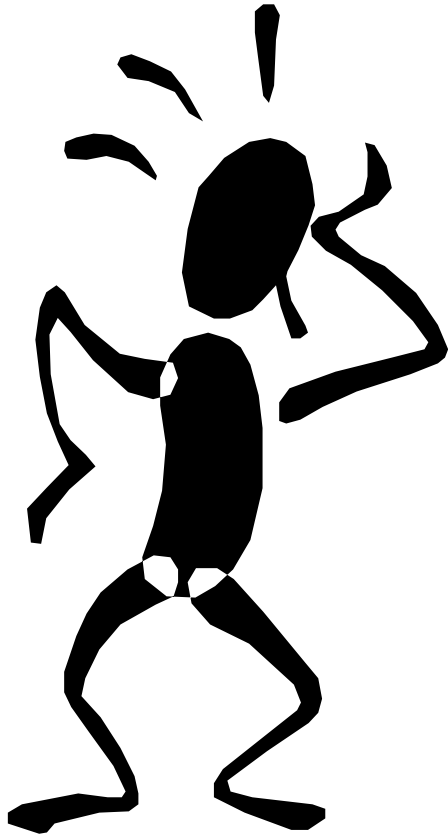
## **Annual Fee**

A membership or participation fee charged by most credit card companies. The fee ranges from \$15 to \$55.



## **Credit Report**

A file on you that includes where you work and live, how you pay your bills, and whether you have been sued, arrested, or filed for bankruptcy.



## **Minimum Payment**

The smallest amount of money paid to keep the account from going into default. Often a minimum payment is 2% of the outstanding balance.